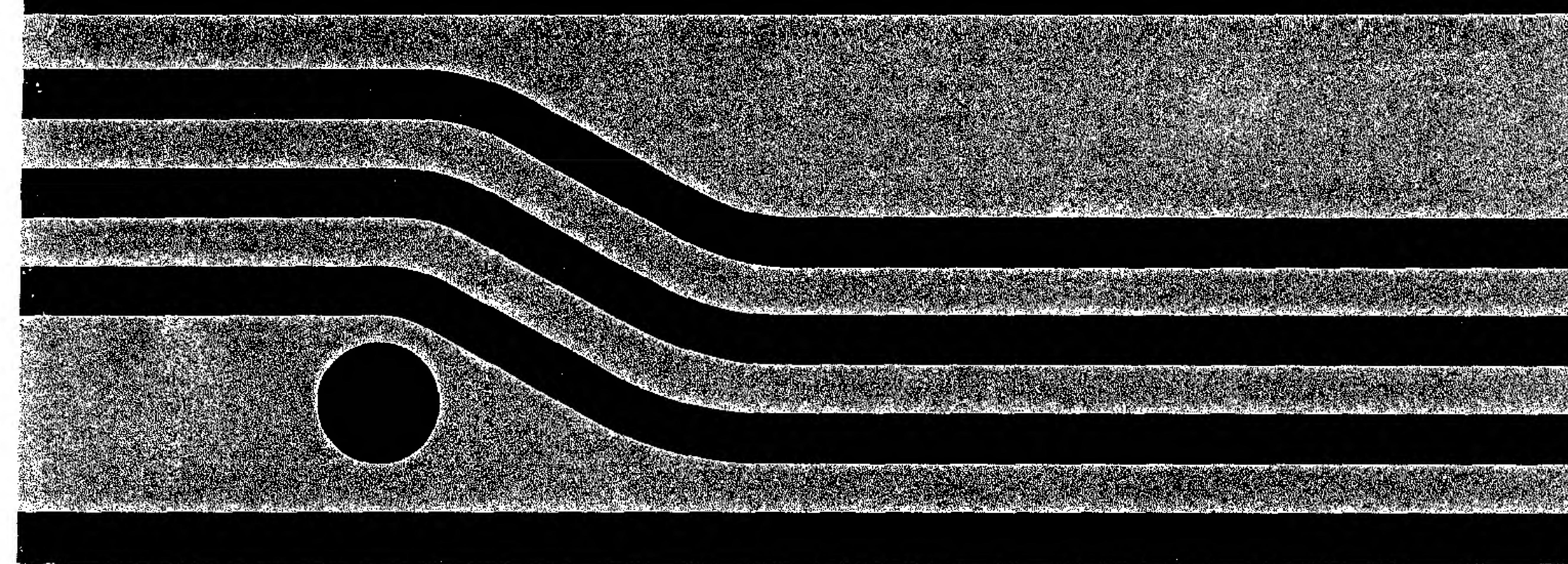




SHARP COMPET
ELSI-MATE

ELECTRONIC CALCULATOR
EL-8110
INSTRUCTION MANUAL



LIMITED WARRANTY

SHARP Electronics Corporation warrants this product to the original purchaser to be free from defective materials and workmanship, and agrees to repair any such defect or to furnish a new or equal part in exchange, except batteries, through an authorized SHARP Factory Service Center.

This warranty does not apply to appearance items nor to any product subjected to misuse, abnormal service or handling, nor to any product altered or repaired by other than an authorized SHARP Factory Service Center.

The period of this warranty covers one (1) year on parts and one (1) year on labor from date of purchase.

This warranty entitles the original purchaser to have service rendered at no cost for the period of the warranty described above when the calculator is carried or shipped into an authorized SHARP Factory Service Center together with proof of purchase.

Neither this warranty nor any other warranty expressed or implied shall extend beyond the period of time listed above.

In no event shall SHARP be liable for consequential damage.

SHARP Electronics Corporation 10 KEYSTONE PLACE PARAMUS, N.J. 07652

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1. INTRODUCTION

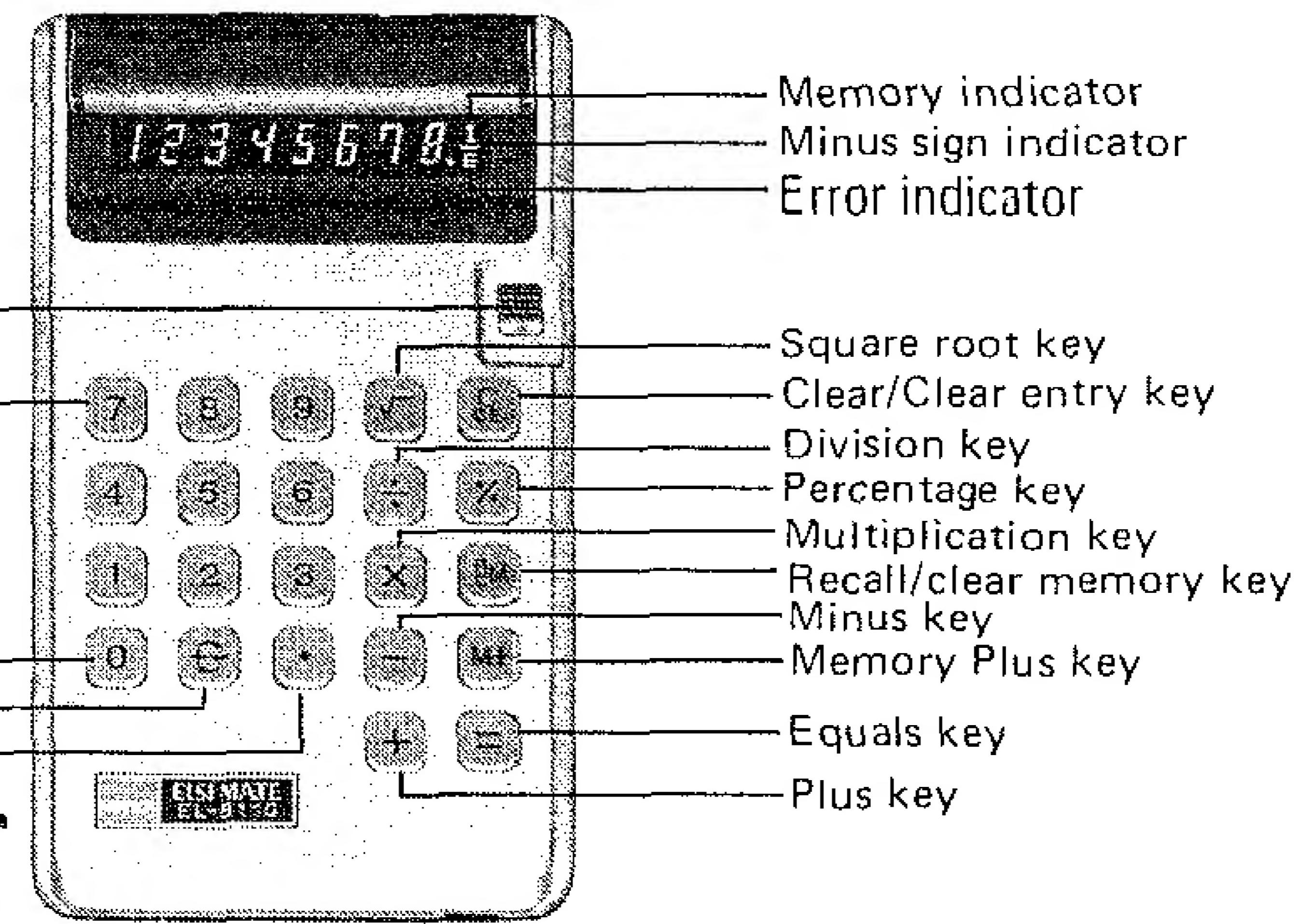


Sharp's new EL-8110 is super thin and super convenient. It's so thin, in fact, that you hardly notice it in your shirt pocket when you travel. Yet you can perform complicated calculations up to 8 digits with amazing ease and convenience. And ² "Liquid Crystal" Display.

2. KEY LAYOUT CHART

Hood is combined with power switch. When the power switch is turned on, (Upper position) hood will automatically open and close when the power switch is turned off. (Lower position)

Numeral keys
Change sign key
Decimal point key



3. OVERFLOW ERROR

In the following cases, an overflow error symbol turns on. To clear the error, depress the  key.

1. When the integer portion of the result exceeds 8 digits.
2. When the number is devided by zero. ($A \div 0$)
3. When the square root extraction is performed for the negative number.

$$[\sqrt{-X} \ (X \geq 0)]$$

4. When the integer portion of the quotient exceeds 16 digits.
5. When the integer portion of the result after adding (subtracting) to (from) memory exceeds 8 digits.

As for the case 1, the upper significant 8 digits of the result is divided by 10^8 (100000000) and then it is displayed on the numeral display-part, and an overflow error symbol (ϵ) is displayed on the symbol display-part.

Therefore, the decimal point of the displayed number means the unit of one hundred million.

Whiles as for the case 2 to 5, the display is occupied "0 · ϵ ".

(Note) In all the cases 1 to 5, the memory retains the contents before the overflow error is detected.

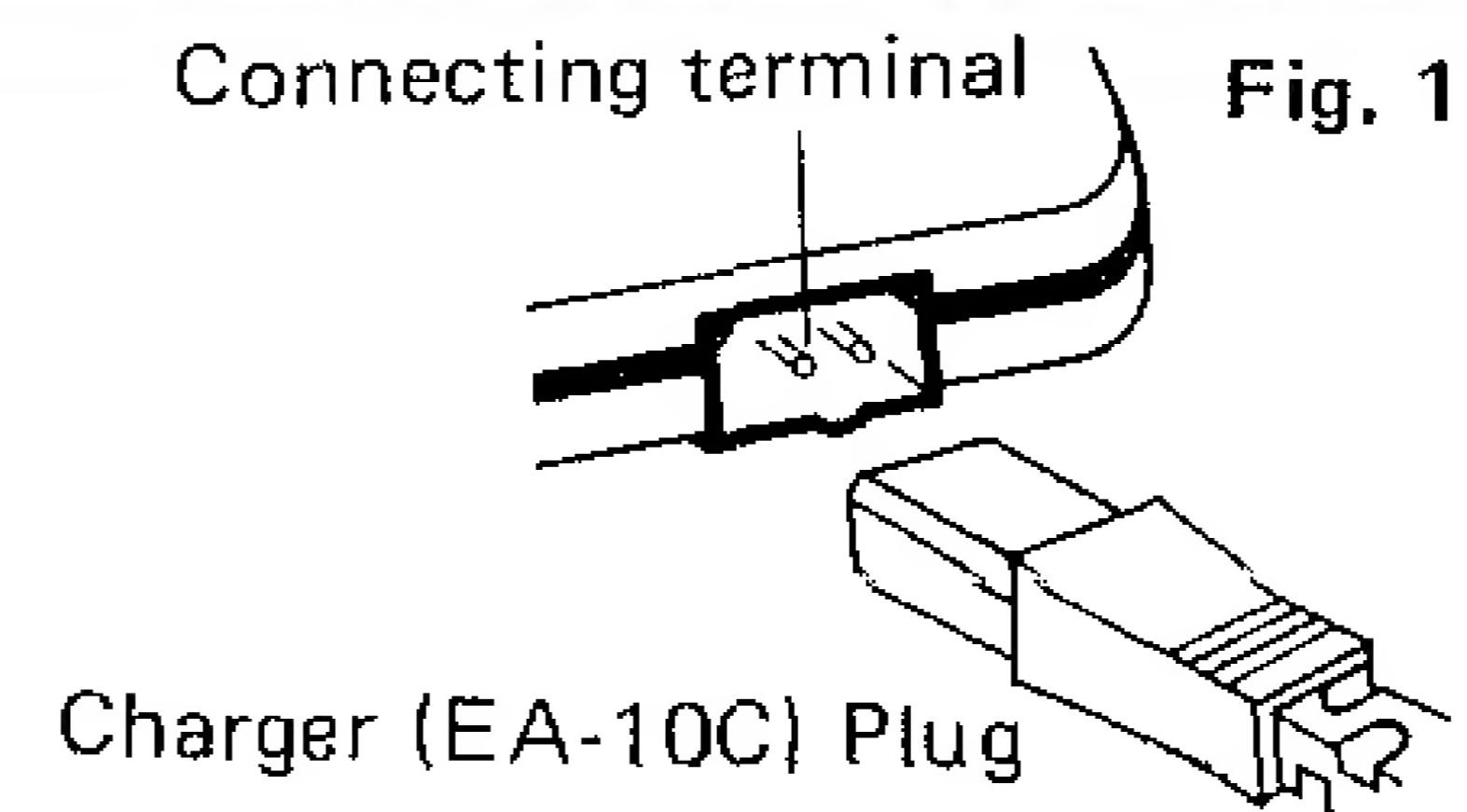
4. NOTES

1. Avoid placing the unit in hot, dusty or humid locations.
2. Do not jolt or drop the unit.
3. When cleaning the cabinet, do not use a wet cloth or any organic solutions such as kerosene or benzine.
4. Please note that temperature changes may effect the rate at which the machine is ready for operation (this is due to the nature of the Liquid Crystal and is not a defect in the machine). If the machine is stored in a cool area, the machine will be ready for use within 10 seconds after the "on" switch has been pressed. If the machine is stored below 32°F, it is recommended that the machine be "warmed-up" in normal room temperature before operating.

5. HANDLING DESCRIPTION FOR FA-10C

(1) HOW TO CONNECT EA-10C

As case of Fig. 1, connect the charger plug into the connecting terminal. Please take care not to mistake the charger plug's polarity.



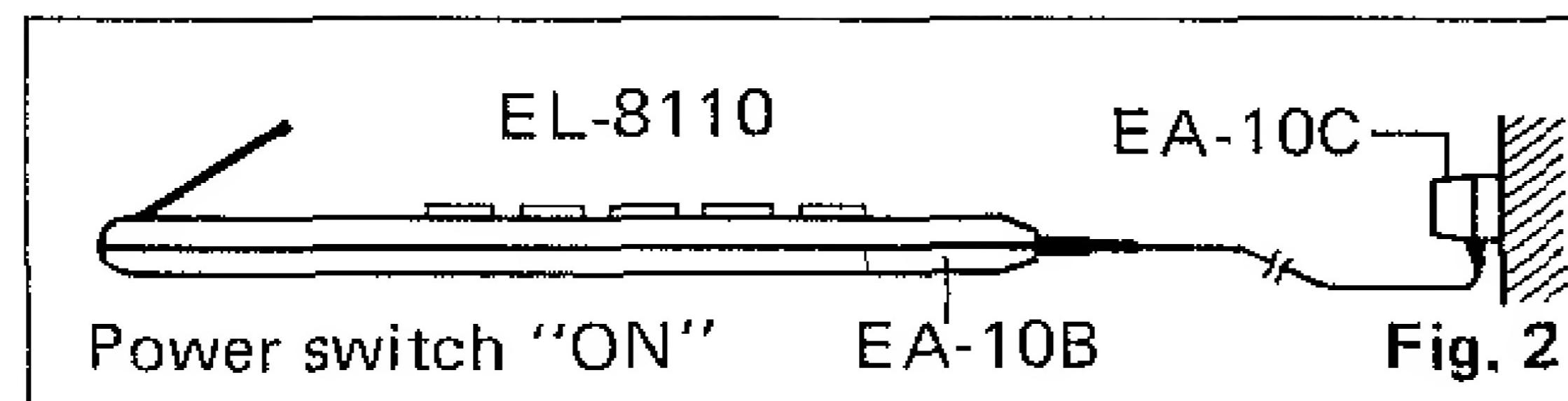
Note 1.

When the voltage of the rechargeable battery is lowered, as connect the charger with power switch on, the display may be not 0. In this case, be sure to turn off the power switch of calculator and turn on the power switch.

Note 2.

To insert or pull the plug of the charger into or from calculator, be sure to turn off the power switch of calculator.

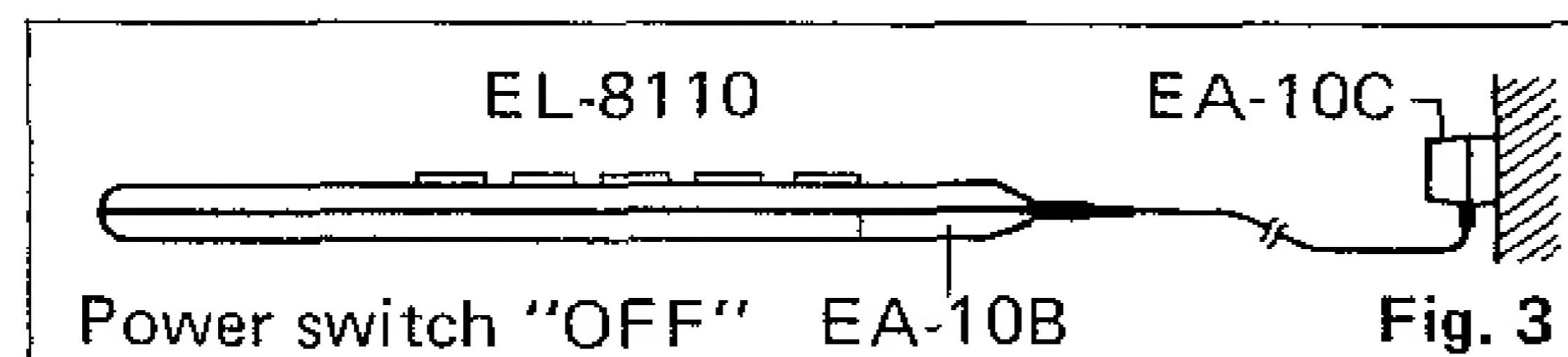
(2) HOW TO USE AS AC ADAPTOR



As the case of Fig. 2, when power switch is "ON" rechargeable battery (EA-10B) is not charged. But EA-10C can be used as AC adaptor.

Note: When battery is silver oxide, mercury or no battery, AC power source from EA-10C is cut off automatically.

(3) HOW TO USE AS CHARGER



As the case of Fig. 3, when power switch is "OFF", rechargeable battery (EA-10B) can be charged up completely with about 15 hours.

After charging, the calculator can be operated for about 8 hours and then the display will automatically disappear indicating that the battery gets discharged and thus mis-calculation is prevented.

Note: Never use the charger except EA-10C for recharging the EA-10B.

Specification of EA-10C

TYPE:	EA-10C
Input:	See the name plate of each charger
Output:	DC 3.0V max 10mA
Temperature:	0°C ~ 40°C

Note 1. The charger varies in shape depending upon its destination.

Note 2. Input side plug of each charger varies in shape depending upon its destination.

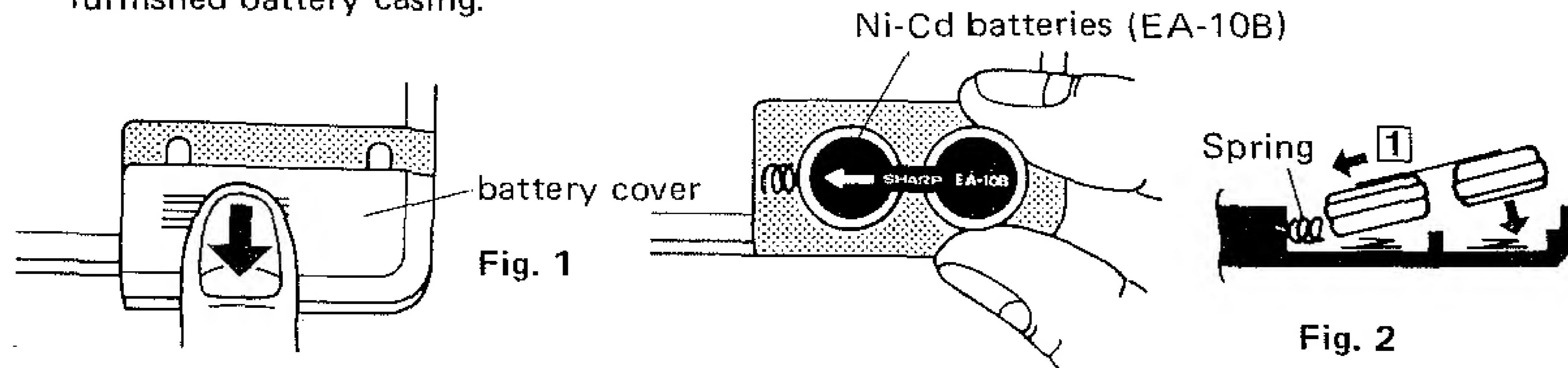
6. HANDLING DESCRIPTION FOR RECHARGEABLE BATTERY (EA-10B)

- Never use the battery in the place with temperature of below 0°C or above 40°C. Otherwise, the battery will become hard to be charged and its characteristics will be deteriorated.
- When the battery is used in the first time after it has been unused for more than three months, usable time of the battery may be shorter than usual because of its natural discharge proper to the battery characteristics. But, the battery restores ordinary stage by repeating a charge/discharge two or three times.
- After use, the battery should not be thrown into fire or garbage box. Because the battery in the place with extreme low/high temperature may explode or leak the solution by expanding or contracting of organic material.
- Wipe the terminals with dry cloth once a month. (Do not use any organic solutions.)
- If the usable time of the battery becomes half-time than new one under regular charging, the battery life has expired. In this case replace the battery pack with new one.

The rechargeable battery EA-10B is available in our Sharp service shop or service station.

7. HOW TO REPLACE THE BATTERY

1. Set the power switch at off position.
2. Slide a battery cover in the direction of an arrow mark and push lightly to take it out. (Fig. 1)
3. Put Ni-cd battery (EA-10B), while pressing the spring in the arrowed direction 1 . (Fig. 2)
Take care not mistake the battery polarity.
4. Slide the battery cover into the unit.
5. When the voltage of the batteries are lowered, the displays will disappear automatically. In this case, please recharge the Ni-Cd batteries or put the new mercury batteries in the unit.
6. When using silver oxide battery (type G-13) or mercury battery (type H-C), be sure to use the furnished battery casing.



8. USE OF SILVER OXIDE BATTERY OR MERCURY BATTERY

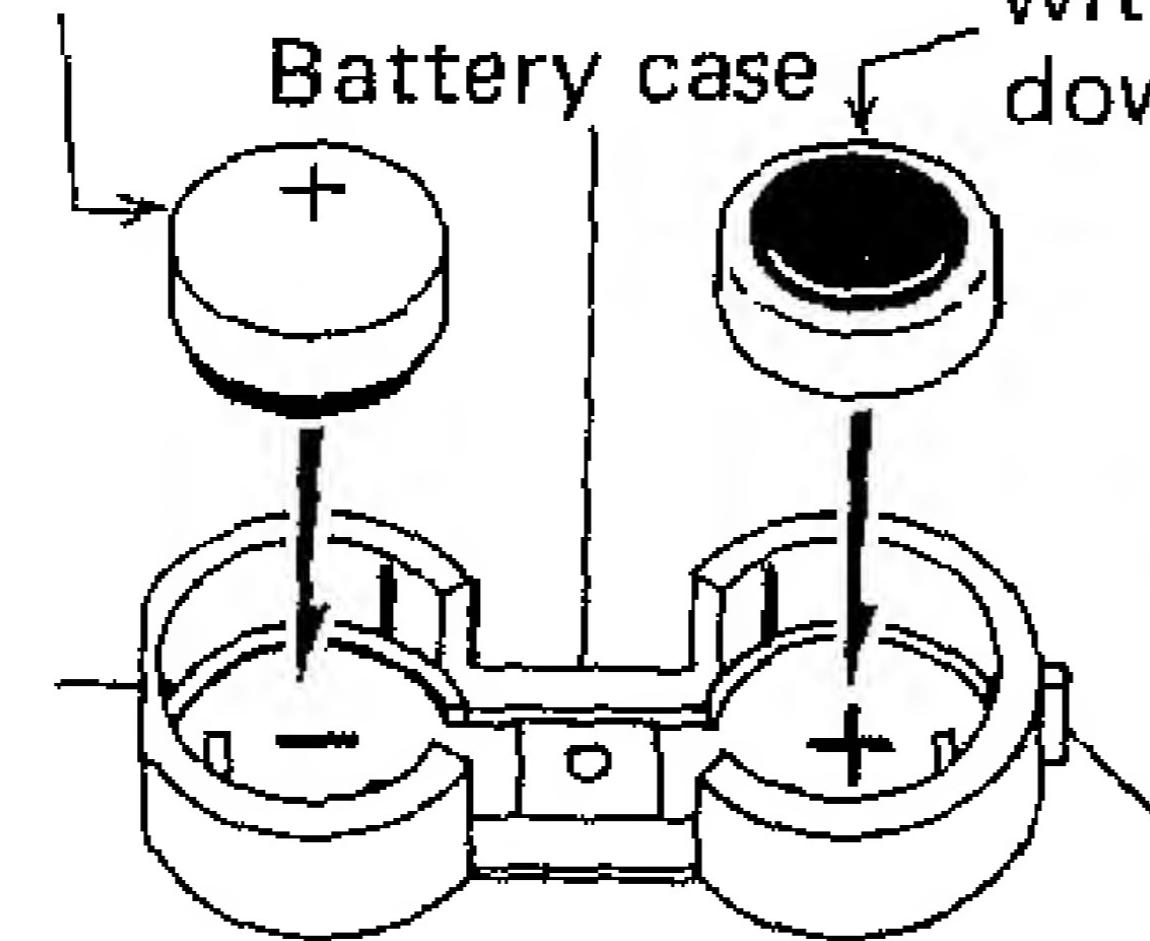
The EL-8110 can be operated on the silver oxide battery or mercury battery as well as the said rechargeable battery. The use of silver oxide battery or mercury battery is convenient when you take a private or official trip together with the calculator since it does not need the charger.

- **Battery case:**

Using silver oxide battery or mercury battery should need a battery case.

When setting the battery to the case, take care of the polarities — how to set the battery is shown below figure.

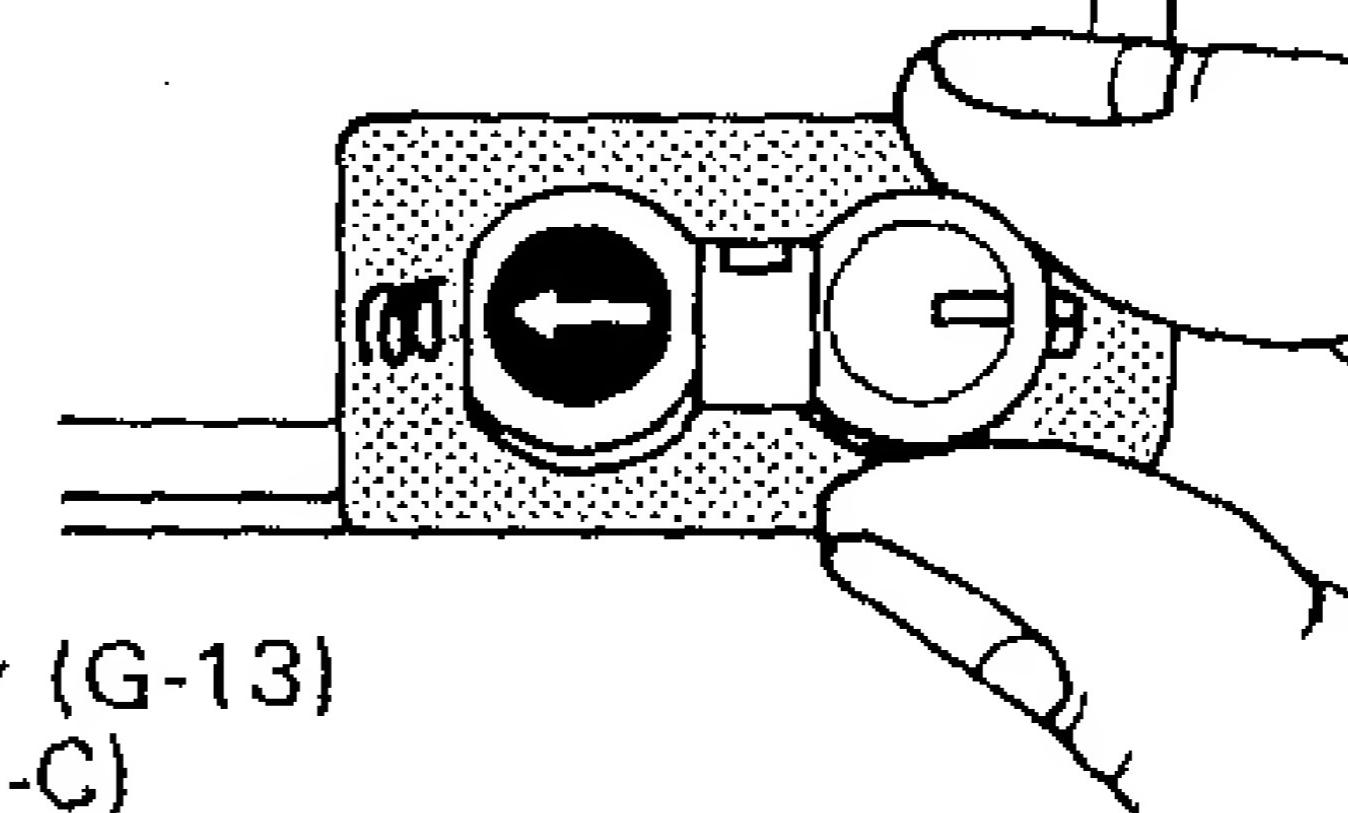
Insert the battery with
+ side facing upwards.



Insert the battery
with + side facing
downwards.



- Insert the battery case into the machine with the case inside out as illustrated below.



- Take care not to mistake the battery polarity.

- **Silver oxide battery:**

The recommendable silver oxide battery is EA-13G which is available for home use in the market. If EA-13G is hard to purchase, use two pieces of G-13 type. With the silver oxide battery the calculator can operate for about 25 hours. (In addition to EA-13G the use of G-13, S-15, S-76E, MS-76H and R76-G is allowed.)

- **Mercury battery:**

The recommendable mercury battery is H-C type. In this case, two of batteries are needed to operate the calculator and the usable time is about 15 hours. (The use of RM-675R, PX-675, E675, M-1C, M15 and MR07 is also possible.)

- **Sales shop of silver oxide battery and silver battery:**

These types of battery are available in an electric appliances shop or camera shop.

- **Cautions:**

It is impossible to charge the silver oxide battery or mercury battery. The calculator is so designed that the calculator can not operate on AC as far as it incorporates silver oxide battery or mercury battery. When these batteries are put in use, it is, however, needed to look about the consumption of battery voltage from time to time.

9. OPERATIONS

(1) Addition & Subtraction

	Examples	Operation & Display
1	$123 - 45.6 + 789 = 866.4$	123 $\boxed{-}$ 45.6 $\boxed{+}$ 789 $\boxed{=}$ \longrightarrow 866.4

(2) Multiplication & Division

	Examples	Operation & Display
1	$(-1.15) \times 365 \div 0.5 = -839.5$	1.15 $\boxed{\times}$ 365 $\boxed{\div}$.5 $\boxed{=}$ \longrightarrow 839.5-

(3) Constant calculation

	Examples	Operation & Display
1	$\underline{295} \times 8 = 2360$	295 $\times 8 \text{ [=} \longrightarrow 2360.$
2	$\underline{295} \times 6 = 1770$	6 $\text{[=} \longrightarrow 1770.$
3	$18 \div \underline{2} = 9$	18 $\div 2 \text{ [=} \longrightarrow 9.$
4	$12 \div \underline{2} = 6$	12 $\text{[=} \longrightarrow 6.$

(4) Power calculation

	Examples	Operation & Display
1	$5^2 = 25$	5 $\times \text{[=} \longrightarrow 25.$
2	$((2^3)^2)^2 = 4096$	2 $\times \text{[=} \text{[=} \times \text{[=} \times \text{[=} \longrightarrow 4096.$

(5) Reciprocal calculation

	Examples	Operation & Display
1	$1/7 = 0.1428571\dots$	7 $\div \equiv$ → 0.1428571

(6) Square root calculation

	Examples	Operation & Display
1	$\sqrt{7 \times 8} + \sqrt{9} = 10.483314$	7 \times 8 \equiv $\sqrt{\quad}$ + 9 $\sqrt{\quad}$ \equiv → 10.483314

(7) Percentage calculation

	Examples	Operation & Display
1	$1200 \times 25\% = 300$	1200 \times 25 $\%$ → 300.
2	$1200 \times 83\% = 996$	83 $\%$ → 996.
3	$108 \div 360 = 30\%$	108 \div 360 $\%$ → 30.
4	$162 \div 360 = 45\%$	162 $\%$ → 45.

(8) Tax/discount calculation

	Examples	Operation & Display
1	$6000 + 6000 \times 15(\%) = 6900$	6000 \times 15 % $+$ \equiv \longrightarrow 6900.
2	$6000 - 6000 \times 12(\%) = 5280$	6000 \times 12 % $-$ \equiv \longrightarrow 5280.

(9) Approximate calculation

	Examples	Operation & Display
1	$96857431 + 4563211$ $= 101420642$	96857431 $+$ 4563211 \equiv \longrightarrow 1.0142064E
2	1234567×25896 $= 31970347032$	1234567 \times 25896 \equiv \longrightarrow 319.70347E

(10) Memory calculation

	Examples	Operation & Display
1	$46 + 78 = 124$ $+ 125 - 59 = 66$ $- 72 + 86 = 158$ <u>Total 32</u>	$\text{R} \text{M}$ $\text{R} \text{M}$ $46 + 78 \text{ M+} \longrightarrow 124.$ ¹ $125 - 59 \text{ M+} \longrightarrow 66.$ ¹ $72 + 86 = \text{C} \text{ M+} \longrightarrow 158.$ ¹ $\text{R} \text{M} \quad 32.$ ¹
2	$(123 + 45) \times (456 - 89)$ $= 61656$ $369 \times 8 = 2952$ $+ 258 \div 6 = 43$ $- 147 \times 12 = 1764$ <u>Total 1231</u>	$\text{R} \text{M} \text{ R} \text{M} 123 + 45 \text{ M+} \longrightarrow 168.$ ¹ $456 - 89 \times \text{R} \text{M} = \longrightarrow 61656.$ ¹ $\text{R} \text{M} \text{ R} \text{M} 369 \times 8 \text{ M+} \longrightarrow 2952.$ ¹ $258 \div 6 \text{ M+} \longrightarrow 43.$ ¹ $147 \times 12 \text{ C M+} \longrightarrow 1764.$ ¹ $\text{R} \text{M} \longrightarrow 1231.$ ¹

	Examples	Operation & Display
3	$5 \times 8 = 40$ $5 \times 7 = 35$ $+) 5 \times (-4) = -20$ Total 55	$\text{RM} \text{ RM} 5 \times 8 \text{ M+} \longrightarrow 40.$ $7 \text{ M+} \longrightarrow 35.$ $4 \text{ C M+} \longrightarrow 20.$ $\text{RM} \longrightarrow 55.$

(11) Correcting mistaken entry

	Examples	Operation & Display
1	$123 + 455 \rightarrow 123 + 456$	$123 + 455 \text{ CE } 456 \text{ M+} \longrightarrow 579.$
2	$7 \div 9 \rightarrow 7 \times 9$	$7 \div \times 9 \text{ M+} \longrightarrow 63.$

10. SPECIFICATIONS

Power source:	AC:Ni-Cd battery (EA-10B) operated for 8 hours Silver oxide (G-13) type operated for 25 hours Mercury battery (H-C) type operated for 15 hours (Slightly changes according to the kinds of the batteries and the way of use.)
Capacity:	8 digits
Decimal point:	Complete floating decimal point positioning
Indicators:	4 arithmetic calculations, chain multiplication and division, constant multiplication and division, tax/discount calculation, power calculation, percentage calculation, mixed calculation, approximate calculation, square root calculation, memory calculation.
Temperature:	0°C ~ 40°C
Components:	LSI, etc.
Power consumption:	DC: 0.025W.*
Dimensions:	9mm(H) x 76mm(W) x 129mm(D)
Weight:	100g (with the EA-10B)

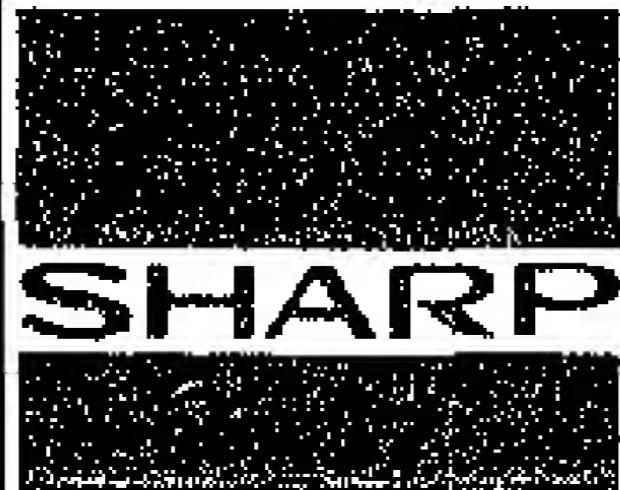


INTERNATIONAL WARRANTY SYSTEM

In an agreement with Sharp's international service network, warranty repair may be obtained for any Sharp battery-operated consumer calculator within one (1) year of the purchase date when presented along with an international warranty certificate to any of the service centers listed below.

Australia, Hong Kong, Iran, Japan, Kuwait, Lebanon,
Malaysia, Panama, Philippines, Singapore, South Africa,
Thailand, United Kingdom, U.S.A., West Germany

This international warranty certificate is not necessary to receive warranty repair within the continental United States. However, if you plan to travel abroad, an international warranty certificate may be obtained free of charge by sending your dated proof of purchase listing the model and serial number of your calculator to Sharp Electronics Corporation, 10, Keystone Place, Paramus, N.J. 0752, ATT: NATIONAL SERVICE MANAGER. Your proof of purchase will be returned to you along with your international warranty certificate. Please allow three (3) weeks for processing.

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